CLAIMS

1 A pen-type injector comprising a housing;
a piston rod adapted to operate through the housing;
a dose dial sleeve located between the housing and the piston rod, the dose dial sleeve having a helical thread of first lead;
a drive sleeve located between the dose dial sleeve and the piston rod, the drive sleeve having a helical groove of second lead;
characterised in that the first lead of the helical thread and the second lead of the helical groove are the same.

2 A pen-type injector according to claim 1, characterised in that the piston rod has a first threaded portion at a first end and a second threaded portion at a second end;
an insert or radially inwardly extending flange is located in the housing and through which the first threaded portion of the piston rod may rotate;
the dose dial sleeve being rotatable with respect to the housing and the insert;
the drive sleeve being releasably connected to the dose dial sleeve and connected to the piston rod for rotation with respect thereto along the second threaded portion of the piston rod;
a button is located on the dose dial sleeve and rotatable with respect to the dose dial sleeve; and
clutch means are provided which upon depression of the button permit rotation between the dose dial sleeve and the drive sleeve.

3 A pen-type injector according to claim 1 or claim 2, in which the injector further comprises a nut which is rotatable with respect to the drive sleeve and axially displaceable but not rotatable with respect to the housing.

4 A pen-type injector according to claim 3, in which the drive sleeve is provided at a first end with first and second flanges with an intermediate thread between the first and second flanges, the nut being disposed between the first and second flanges and keyed to the housing by spline means.

5 A pen-type injector according to claim 4, in which a first radial stop is provided on a second face of the nut and a second radial stop is provided on a first face of the second flange.

6 A pen-type injector according to any of claims 2 to 5, in which the first thread of the piston rod is oppositely disposed to the second thread of the piston rod.

7 A pen-type injector according to any of claims 2 to 6, in which a second end of the clutch is provided with a plurality of dog teeth adapted to engage with a second end of the dose dial sleeve.

8 A pen-type injector according to any of claims 2 to 7, in which the pen-type injector further includes clicker means disposed between the clutch means and spline means provided on the housing.

9 A pen-type injector according to claim 8, in which the clicker means comprises a sleeve provided at a first end with a helically extending arm, a free end of the arm having a toothed member, and at a second end with a plurality of circumferentially directed saw teeth adapted to engage a corresponding plurality of circumferentially saw teeth provided on the clutch means.

10 A pen-type injector according to claim 8, in which the clicker means comprises a sleeve provided at a first end with at least one helically extending arm and at least one spring member, a free end of the arm having a toothed member, and at a second end with a plurality of circumferentially directed saw teeth adapted to engage a corresponding plurality of circumferentially directed saw teeth provided on the clutch means.

11 A pen-type injector according to any previous claim, in which the main housing is provided with a plurality of maximum dose stops adapted to be abutted by a radial stop provided on the dose dial sleeve.

12 A pen-type injector according to claim 11, in which at least one of the maximum dose stops comprises a radial stop located between a helical rib and spline means provided at a second end of the housing.

13 A pen-type injector according to claim 11, in which at least one of the maximum dose stops comprises a part of a raised window portion provided at a second end of the housing.

14 A pen-type injector according to any previous claim, in which the dose dial sleeve is provided with a plurality of radially extending members adapted to abut a corresponding plurality of radial stops provided at a second end of the housing.